

CLAIMS

1. A vacuum pumping arrangement comprising a drive shaft, a motor for
5 driving said drive shaft, a molecular pumping mechanism and a regenerative
pumping mechanism, wherein said drive shaft is arranged for simultaneously
driving said molecular pumping mechanism and said regenerative pumping
mechanism and said drive shaft is supported by a lubricant free bearing
associated with said molecular pumping mechanism.
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2. An arrangement as claimed in claim 1, wherein said lubricant free
bearing is a magnetic bearing.
3. ~~An arrangement as claimed in claim 1 or 2, wherein said lubricant free~~
15 bearing and the molecular pumping mechanism are substantially axially
aligned.
4. An arrangement as claimed in any preceding claim, wherein said drive
shaft is additionally supported by a lubricated bearing associated with said
20 regenerative pumping mechanism.
5. An arrangement as claimed in claim 4, wherein said lubricated bearing
is a rolling bearing.

6. An arrangement as claimed in claim 4 or claim 5, wherein said lubricated bearing and the regenerative mechanism are substantially axially aligned.

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7. An arrangement as claimed in any of claims 4 to 6, wherein said regenerative pumping mechanism comprises a stator comprising a plurality of circumferential pumping channels disposed about a longitudinal axis of the drive shaft and a rotor comprising a plurality of arrays of rotor blades
10 extending axially into respective said circumferential pumping channels.

8. An arrangement as claimed in claim 7, wherein said rotor of said regenerative pumping mechanism is connected to said drive shaft so as to be sufficiently close to said lubricated bearing so that radial movement of said
15 drive shaft at said lubricant free bearing translates substantially to axial movement of said rotor blades relative to respective said circumferential pumping channels.

9. An arrangement as claimed in claim 7 or 8, wherein said lubricated
20 bearing and said circumferential pumping channels are substantially axially aligned.

10. An arrangement as claimed in any one of claims 7 to 9, wherein said lubricated bearing is housed in the stator of the regenerative pumping mechanism.

5 11. An arrangement as claimed in any one of the preceding claims, wherein said molecular pumping mechanism comprises molecular drag pumping means.

12. An arrangement as claimed in any one of the preceding claims,
10 wherein said molecular pumping mechanism comprises turbomolecular pumping means.

13. An arrangement as claimed in any one of the preceding claims,
comprising a housing which houses the molecular pumping mechanism, the
15 regenerative pumping mechanism, the drive shaft and the motor.

14. A vacuum pumping arrangement comprising a drive shaft, a motor for driving said drive shaft, and a regenerative pumping mechanism, said drive shaft being supported towards one end thereof by a lubricant free bearing and
20 towards the other end thereof by a lubricated bearing, said regenerative pumping mechanism comprising a stator comprising a plurality of circumferential pumping channels disposed about a longitudinal axis of the drive shaft and a rotor comprising a plurality of arrays of rotor blades

extending axially into respective said circumferential pumping channels, said rotor being connected to said drive shaft so as to be sufficiently close to said lubricated bearing so that radial movement of said drive shaft at said lubricant free bearing translates substantially to axial movement of said rotor blades

5 relative to respective said circumferential pumping channels.